Midterm Exam

CMSY-199, Fall 2013

Section 1.   Circle the letter of the best answer for each question:

1. Which primitive Java type was used to represent the body mass index (BMI) for Homework 1?

   (a)   `double`

   (b)   `float`

   (c)   `int`

   (d)   `short`

2. What type of Java comment begins with `//` ?

   (a)   end-of-line comment

   (b)   javadoc comment

   (c)   traditional comment

   (d)   None of the above

3. Which of the following is a Java keyword?

   (a)   `ArrayList`

   (b)   `class`

   (c)   `printf`

   (d)   `String`

4. A valid Java identifier may not begin with which type of character?

   (a)   letter

   (b)   digit

   (c)   dollar sign

   (d)   underscore

5. Which is the proper declaration of the `main` method in a Java application which will be invoked directly by the JVM?

   (a)   `public static void main(String[] args)`

   (b)   `public static void main(String args[])`

   (c)   `static public void main(String[] args)`

   (d)   `All of the above`

6. The standard output object in Java is represented by

    (a)   `System.in`

    (b)   `System.err`

    (c)   `System.out`

    (d)   None of the above

7. Given a five-digit `int` variable called `number`, which expression evaluates to the third (middle) digit?

    (a)   `number / 10 % 100`

    (b)   `number % 10 / 100`

    (c)   `number / 100 %10`

    (d)   `number % 100 / 10`

8. For Homework 2, how many methods from the `Object` class did the `MayanDate` class override?

    (a)   one

    (b)   two

    (c)   three

    (d)   four

9. The `Scanner` class is in which package?

    (a)   `java.io`

    (b)   `java.lang`

    (c)   `java.system`

    (d)   `java.util`

10. How many primitive types are there in Java?

    (a)   6

    (b)   7

    (c)   8

    (d)   9

11. What is the default initialization value for reference type variables?

    (a)   0

    (b)   `null`

    (c)   `nil`

    (d)   `NULL`

12. How many arguments does the default constructor created by the Java compiler have?

    (a) 0

    (b) 1

    (c) 2

    (d) 3

13. Given the following partial class definition, what is the proper declaration for an instance variable that represents the name of the course?

```
public class GradeBook
{
   /* insert declaration here */

}
```

    (a)   `public static String courseName;`

    (b)   `public static final String COURSE_NAME;`

    (c)   `private String courseName;`

    (d)   `private static String courseName;`

14. What is the output when the following Java application is compiled and run?

```
public class IfElse
{
   public static void main(String[] args)
   {
      int x = 4;
      int y = 6;
      if (x > 5)
         if (y > 5) System.out.println("x and y are > 5");
      else
          System.out.println("x is <= 5");
   }
}
```

    (a)   `x and y are > 5`

    (b)   `x is <= 5`

    (c)   No output is produced

    (d)   Compilation fails

15. Which type of error does the following Java application contain?

```java
public class Hello
{
   public static void main(String[] args);
   {
      System.out.println("Hello World!")
   }
}
```

   (a)   syntax error

   (b)   logic error

   (c)   fatal logic error

   (d)   nonfatal logic error

16. What is the output when the following Java application is compiled and run?

```java
public class WhileTest
{
   public static void main(String[] args)
   {
      int product = 3;
      while (product <= 100)
         product = product * 3;
         System.out.print(product + " ");
   }
}
```

   (a)   9 81 243

   (b)   9 81

   (c)   243

   (d)   No output is produced

17. What is the most logical Java control structure to use when implementing sentinel-controlled repetition?

   (a)   `for`

   (b)   `do...while`

   (c)   `while`

   (d)   `switch`

18. Which operator has the highest precedence in Java?

   (a)   `&&`

   (b)   `++`

   (c)   `*`

   (d)   `=`

19. Which primitive Java type has a size of 32 bits?

    (a) `char`

    (b) `short`

    (c) `float`

    (d) `double`

20. Which component is required in a Java `for` statement header?

    (a) control variable

    (b) loop-continuation condition

    (c) increment of control variable

    (d) semicolon

21. Which of the following is a valid loop-continuation condition for a Java `while` statement?

    (a) `while()`

    (b) `while(0)`

    (c) `while(null)`

    (d) `while(true)`

22. What is the output when the following Java application is compiled and run?

```java
public class DoWhileTest
{
   public static void main(String[] args)
   {
      int counter = 1;

      do
      {
          System.out.printf("%d ", ++counter);
      } while(counter <= 10);

      System.out.println();
   }
}
```

    (a) 1 2 3 4 5 6 7 8 9 10

    (b) 2 3 4 5 6 7 8 9 10 11

    (c) Compilation fails

    (d) An exception is thrown at runtime

23. Which of the following was added in Java SE 7 as a valid type for a `switch` statement's controlling expression?

    (a) char

    (b) int

    (c) long

    (d) String

24. What line of code should be inserted into the Java application below to produce the output 1 2 3 4 6 7 8 9 10 ?

```java
public class ForTest
{
   public static void main(String[] args)
   {
     for (int counter=1; counter <= 10; counter++)
     {
        /* insert code here */
        System.out.printf("%d ", counter);
     }
   }
}
```

    (a) if (counter == 5) break;

    (b) if (counter == 5) continue;

    (c) if (counter == 5) cycle;

    (d) if (counter == 5) exit;

25. Which of the following logical expressions evaluates to `false`?

    (a) true && true

    (b) true || false

    (c) true ^ true

    (d) !false

26. Given the following Java statement, which value for the variable `number` will return `true`?
    `if (number / 100 == number % 10) return true;`

    (a) 121

    (b) 112

    (c) 211

    (d) 123

27. What line of code could be inserted into the Java application below to produce the output 3 4 5?

```java
public class Triple
{
    public static void main(String[] args)
    {
        int side1 = 3;
        int side2 = 4;
        int hypot = 5;

        /* insert code here */
            System.out.printf("%d %d %d", side1, side2, hypot);
    }
}
```

(a)   `if (side1 * side1 + side2 * side2 == hypot * hypot)`

(b)   `if (Math.pow(side1,2) + Math.pow(side2,2) == Math.pow(hypot,2))`

(c)   `if (Math.hypot(side1,side2) == hypot)`

(d)   Any of the above

28. For Homework 3, what data structure was used as an instance variable to implement the `Hand` class?

(a)   `ArrayList<Card>`

(b)   `Arrays<Card>`

(c)   `Card[]`

(d)   None of the above

29. Which of the following Java expressions is suitable for determining the minimum of three numbers - `a`, `b`, and `c` - using the static `min` method from the `java.lang.Math` class?

(a)   `Math.min(a,b,c)`

(b)   `Math.min(a,Math.min(b,c))`

(c)   `Math.min(double a, double b, double c)`

(d)   `Math.min(double...  a)`

30. The `Random` class from the Java SE 7 API is in the same package as which of the following classe(s)?

(a)   `ArrayList<E>`

(b)   `Arrays`

(c)   `Scanner`

(d)   All of the above

31. Given a reference to an instance of the `Random` class called `randomNumbers` and an `int` variable named `face`, which Java statement can be used to simulate the outcome of rolling a six-sided die?

    (a) `face = randomNumber.nextInt(6);`

    (b) `face = 1 + randomNumber.nextInt(5);`

    (c) `face = 1 + randomNumber.nextInt(6);`

    (d) None of the above

32. Which of the following statements is true about a Java enumeration?

    (a) An enumeration declares a set of constants represented by identifiers

    (b) Java allows an `int` to be compared to an enumeration constant

    (c) The identifiers in an enumeration need not be unique

    (d) All of the above

33. What is the scope of a variable which is declared inside a Java method?

    (a) any class within the same package

    (b) the entire body of the class

    (c) all methods in the class

    (d) the method in which it was declared

34. Which of the following is *not* part of a method's signature?

    (a) method name

    (b) number of parameters

    (c) order of the parameters

    (d) return type

35. If an attempt is made to change an element of a Java array using an index value which is less than 0 or greater than `length-1`, what type of exception is thrown?

    (a) `ArrayIndexOutOfBoundsException`

    (b) `BadIndexException`

    (c) `ConcurrentModificationException`

    (d) `NullPointerException`

36. What is passed to a method that has an array as its argument?

    (a) the array itself

    (b) a copy of the array

    (c) copies of all the array elements as a variable-length argument list

    (d) a copy of the reference to the array

37. What is the output when the following Java application is compiled and run?

```
import java.util.*;

public class People
{
   public static void main(String[] args)
   {
      ArrayList<String> people = new ArrayList<String>();
      people.add("Thomas");
      people.add("Richard");
      people.add("Harold");
      people.add(0, "Michael");

      for (String name : people)
      {
         if (name.equals("Thomas"))
         {
            people.remove(0);
         }
      }
      System.out.println(people);
   }
}
```

   (a)   [Thomas, Richard, Harold]

   (b)   [Michael, Thomas, Richard, Harold]

   (c)   Compilation fails

   (d)   An exception is thrown at runtime

38. If a single-threaded Java program frequently performs string concatenation or other string modifications, which of the following types would perform those operations most efficiently?

   (a)   char[]

   (b)   String

   (c)   StringBuilder

   (d)   StringBuffer

39. Which of the following String values matches the regular expression
   "[8-9]\\d{2}-\\d{3}[8-9]" ?

   (a)   844-1212

   (b)   848-1900

   (c)   867-5309

   (d)   936-1212

40. What is the output of the following Java application?

```java
public class FooBar
{
   public static void main(String[] args)
   {
      String foo = "Foo";
      String bar = "Bar";
      String foobar = "FooBar";

      System.out.printf("%b %b\n", foobar.equals(foo + bar), foobar == "FooBar");
   }
}
```

  (a)   true true

  (b)   true false

  (c)   false true

  (d)   false false